

## September 2015 Regional Climate Summary

### For the San Francisco Bay Area and Monterey Bay Area

**September 2015 was a warm month** – the third consecutive month in which average monthly temperatures were the warmest on record at climate stations across the San Francisco and Monterey Bay Areas. In July 2015, eight climate stations experienced a record warm average monthly temperature, and 12 locations had their warmest August on record. Five more climate stations had a record warm September. As was the case during the previous two months, persistent warmer-than-normal sea surface temperatures during September helped elevate monthly average temperatures into record territory. In addition, two heat events in September contributed to the month's record warmth. Sporadic light rain events during September resulted in some climate stations (mainly in the North Bay) picking up greater than normal total monthly precipitation. But for the majority of locations, September was a dry month with little or no rainfall.

The first heat event in September spanned the four day period from Monday September 7 through Thursday, September 10. Strong high pressure aloft combined with light offshore flow sent temperatures soaring into record territory. Six daily high temperature records were set or tied over this four day period. The high of 95 degrees in San Francisco on September 8 was **not** a record high for the date, but it was **the warmest high temperature in the City in over five years** (since August 24, 2010, when the high was 98).

The heat event ended on Friday, September 11 when a cooling onshore flow developed. Fog returned to the coast on the 11<sup>th</sup> and mid-level clouds flowed across the region. These mid-level clouds formed from residual moisture left over from former Hurricane Linda in the Eastern Pacific.



***Image of San Francisco taken from the “Castro Cam” at 7 am on Friday, September 11, showing mid-level clouds along with a thin fog layer at the surface.***

Moisture from remnants of former Hurricane Linda continued to increase across the region on Saturday September 12. Radar indicated precipitation within a layer of mid-level clouds, but almost none of that precipitation reached the ground and instead mostly evaporated in the dry sub-cloud layer. It has been speculated that the combination of that the mid-level moisture from Linda and dry air near the surface on September 12 created conditions that resulted in locally strong winds across portions of Northern California, including the North Bay and Lake County. These winds caused the “Valley Fire” in Lake County to spread rapidly on September 12. The rate of fire spread across Lake County was remarkable. 40,000 acres were charred in the 12 hours after the fire began. For details about how meteorological conditions on September 12

resulted in rapid fire growth, see the blog post from Neil Lareau at San Jose State University at the following link:

<http://www.fireweather.org/blog/2015/9/15/did-tropical-moisture-contribute-to-the-valley-fire-blow-up>

A weak upper low off the California coast combined with residual moisture from Hurricane Linda to produce isolated light showers on September 13 and 14. Rainfall amounts from these isolated showers were generally only a few hundredths or less.

A cold front swept into Northern California on Wednesday, September 16. The front dissipated rapidly as it pushed into the San Francisco Bay Area. Widespread rain fell north of the Golden Gate, but little or no rain fell from San Francisco southward. In the North Bay, lower elevation locations picked up as much as a half inch of rain. Precipitation amounts were heavier in the coastal hills of Sonoma County. Venado, in northwest Sonoma County, picked up 1.64" of rain on the 16<sup>th</sup>.

Warm and dry weather conditions developed by Saturday, September 19 as high pressure began to build over California. A wildfire broke out on the afternoon of September 19 in a remote section of north-central Monterey County south of Carmel Valley. This fire, called the "Tassajara Fire", generated a large smoke plume by late afternoon and early evening. Offshore winds aloft swept the smoke plume westward towards Monterey and Carmel.



***Smoke plume from the Tassajara Fire as seen from the National Weather Service Office in Monterey at 7 pm on the evening of November 19.***

High pressure continued to strengthen through the weekend and by Sunday, September 20 high temperatures reached record levels at San Francisco Airport and Richmond.



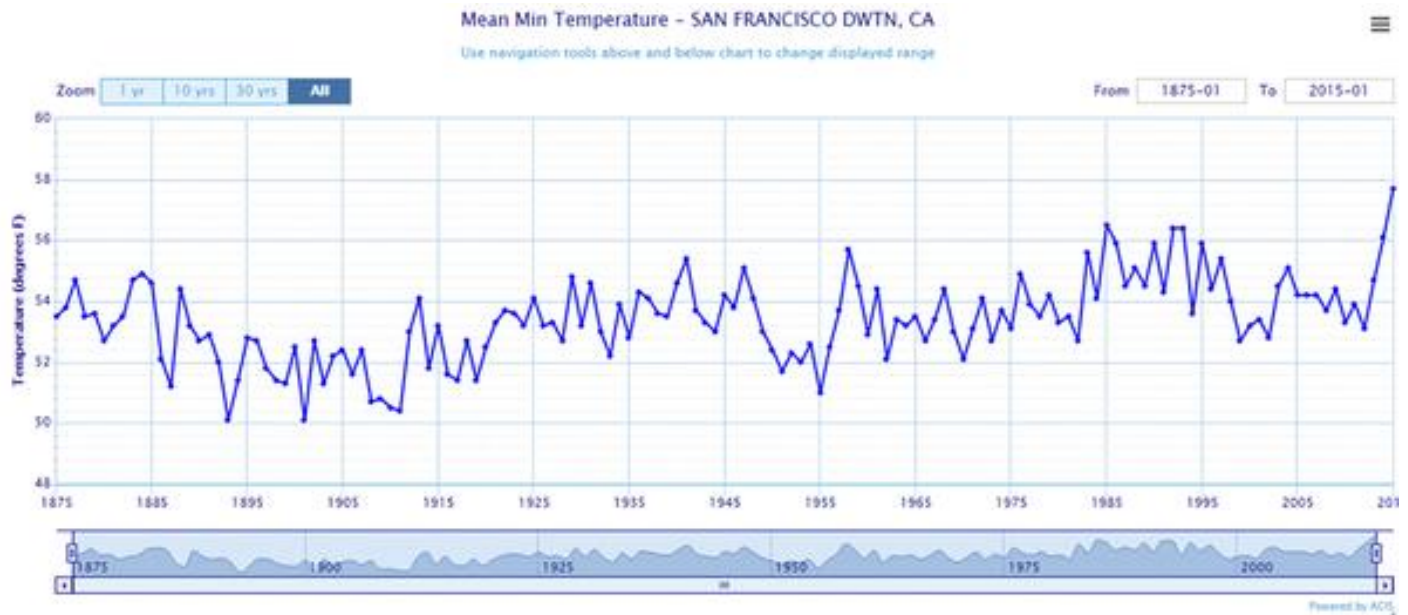
***This photo of a burned-out section of Tassajara Road near Parrot Ranch was taken on Sunday, September 20. The Tassajara Fire burned slightly more than 1000 acres. Photo: Vern Fisher***

Cooling began near the coast on September 21, but hot conditions prevailed inland, allowing for one more record high at Gilroy.

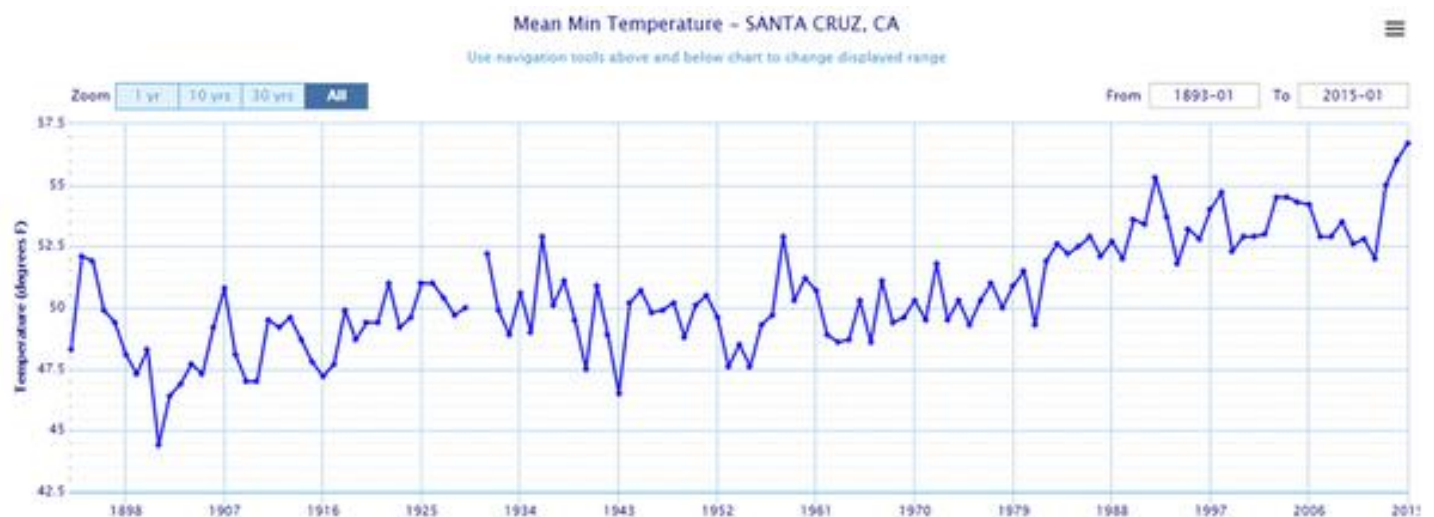
A weak weather system approached the northern California Coast late in the month, generating light amounts of rainfall across the central and southern San Francisco Bay Area on Wednesday, September 30. Rainfall amounts were less than a tenth of an inch.



A note about the past summer: Average summer minimum temperatures (June-August) at two coastal locations (San Francisco Downtown and Santa Cruz) were the warmest on record:



Graph showing average summer minimum temperatures at San Francisco Downtown since 1875. Note that the average low temperature of 57.7 degrees F for the summer of 2015 was the warmest of any year on record. The previous record warm summer average minimum temperature for San Francisco Downtown was 56.5 degrees in 1985.



Graph showing average summer minimum temperatures at Santa Cruz since 1893. Note that the average low temperature of 56.7 degrees F for the summer of 2015 was the warmest of any year on record. The previous record warm summer average minimum temperature for Santa Cruz was 56.0 degrees in 2014.

## **September Temperatures**

Average temperatures for September 2015 were above normal at all climate stations, and were the warmest on record for five locations:

Location	Sept 2015 Average Temperature*	Normal Sept Avg. Temp	Departure from Normal	Previous Sept record warm Sept. average temp and year
Saint Helena	72.5	69.2	+3.3	72.0 in 1997
Berkeley	68.6	64.1	+4.5	Tied with 1984
Santa Cruz	68.7	64.7	+4.0	68.4 in 1984
Watsonville	69.9	63.1	+6.9	Tied with 1984
King City	71.8	68.3	+3.5	Tied with 1984

\* Average Temperature = (Average High Temperature + Average Low Temperature) / 2

In addition, Kentfield and Monterey experienced their 2<sup>nd</sup> and 4<sup>th</sup> warmest September respectively. San Francisco Downtown, with 141 years of temperature records, experienced its 6<sup>th</sup> warmest September.

## **September Regional Temperature Summary**

Location	Average High	Normal High	Departure from Normal	Average Low	Normal Low	Departure from Normal
Sonoma County Airport	87.1	83.2	3.9	50.5	49.3	1.2
Napa Airport	81.5	79.7	1.8	50.4	49.2	1.2
San Rafael	83.6	78.7	4.9	56.0	54.2	1.8
San Francisco Downtown	74.0	70.2	3.8	58.1	55.1	3.0
San Francisco Airport	76.4	73.6	2.8	57.7	55.8	1.9
Redwood City	82.9	79.7	3.2	55.9	54.0	1.9
Concord Airport	87.9	84.1	3.8	59.3	56.1	3.2
Oakland	79.5	74.1	5.4	59.3	57.1	2.2
Oakland Airport	78.2	74.6	3.6	56.9	54.4	2.5
Livermore Airport	90.1	84.3	5.8	58.7	55.5	3.2
Hayward Airport	78.9	75.6	3.3	57.9	57.1	0.8
Moffett Federal Airfield	81.6	77.5	4.1	58.3	57.7	0.6
San Jose	82.4	80.1	2.3	58.0	56.8	1.2
Watsonville Airport	82.7	75.1	7.6	56.6	51.8	4.8
Monterey NWS	72.8	67.3	5.5	57.0	53.1	3.9
Monterey Airport	74.7	69.3	5.4	57.3	53.1	4.2
Salinas Airport	79.3	74.1	5.2	56.6	54.3	2.3

### Daily Temperature Records for September 2015

Date	Location	Record High Temp	Previous Record and Year
9/07	Salinas	94	94 in 2004
9/08	Monterey	95	94 in 1984
9/08	Salinas	98	97 in 1984
9/08	Oakland Airport	95	93 in 1976
9/10	San Rafael	99	99 in 1951
9/10	Gilroy	104	103 in 1976
9/20	San Francisco Airport	93	93 in 1990
9/20	Richmond	96	94 in 1967
9/21	Gilroy	104	100 in 1967

### September Regional Precipitation Summary:

Location	September Rainfall	Normal Sep Rainfall	Percent of Normal
<b>North Bay</b>			
Angwin	0.76	0.46	165
Calistoga	0.55	0.32	172
Cloverdale	0.74	0.32	231
Kentfield	0.53	0.26	204
Muir Woods	0.39	0.36	108
Napa	0.19	0.30	63
Napa Airport	0.06	0.32	19
Occidental	1.11	0.42	264
Petaluma	0.04	0.21	19
Saint Helena	0.25	0.28	89
San Rafael	0.16	0.21	76
Sonoma County Airport	0.42	0.35	120
<b>San Francisco Peninsula</b>			
Half Moon Bay	0.11	0.37	30
Palo Alto	0.00	0.15	0
Redwood City	0.01	0.16	6
San Francisco Airport	0.02	0.17	12
San Francisco Downtown	0.09	0.21	43

<b>East Bay</b>	<b>September Rainfall</b>	<b>Normal Sep Rainfall</b>	<b>Percent of Normal</b>
Antioch	0.01	0.18	6
Berkeley	0.12	0.24	50
Concord	0.03	0.10	30
Concord Airport	0.05	0.16	31
Fremont	0.04	0.21	19
Hayward Airport	0.02	0.32	6
Livermore	0.05	0.22	23
Livermore Airport	0.02	0.22	9
Martinez	0.00	0.18	0
Mount Diablo Junction	0.00	0.28	0
Newark	0.00	0.17	0
Oakland	0.05	0.25	20
Oakland Airport	0.00	0.22	0
Richmond	0.04	0.16	25
<b>South Bay &amp; Santa Cruz County</b>			
Ben Lomond	0.02	0.27	7
Moffett Federal Airfield	0.01	0.18	6
Mount Hamilton	0.00	0.38	0
San Jose	0.01	0.18	6
Santa Cruz	0.03	0.27	11
Watsonville	0.00	0.21	0
Watsonville Airport	0.01	0.23	4
<b>Monterey and San Benito Counties</b>			
Big Sur Station	0.00	0.42	0
Carmel Valley	0.00	0.23	0
Hollister	0.00	0.21	0
King City	0.03	0.15	20
Monterey	0.00	0.24	0
Monterey Airport	0.05	0.20	25
Pinnacles National Park	0.02	0.23	9
Salinas	0.00	0.19	0
Salinas Airport	0.22	0.17	129

### Miscellaneous August Climate Information

<b>Monthly Ranks for Downtown San Francisco</b>		
Average High Temperature	74.0 deg	8 <sup>th</sup> warmest September out of 141 years
Average Low Temperature	58.1 deg	6 <sup>th</sup> warmest September out of 141 years
Average Temperature	66.1 deg	6 <sup>th</sup> warmest September out of 141 years
Precipitation	0.09 in	91 <sup>st</sup> driest September out of 166 years

Monthly Extremes for Select Locations			
Location	Max Temp: Warmest Day(s)	Min Temp: Coolest Day(s)	Precipitation: Wettest Day(s)
Sonoma County Airport	9/09, 9/10	9/04	9/16
	102 degrees	44 degrees	0.41 inches
San Francisco	9/08	four days	9/30
	95 degrees	55 degrees	0.05 inches
Livermore Airport	9/10	9/05, 9/06	9/30
	108 degrees	50 degrees	0.02 inches
San Jose	9/21	9/06, 9/16	9/30
	97 degrees	52 degrees	0.01 inches
Salinas Airport	9/08	9/05, 9/16	9/30
	97 degrees	50 degrees	0.19 inches

**Note: Climatological data included in this document is preliminary. For official certified climatological data please contact the National Climatic Data Center at 828-271-4800 or <http://www.ncdc.noaa.gov>. Official values as determined at the above web site may take several months for authentication and publication.**